



1

SEQUENCE LISTING

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ANJUERE, FABIENNE
BOQUET, PATRICE
MUNRO, PATRICK
FLATAU, GILLES

<120> A VACCINE COMPOSITION COMPRISING AN IMMUNOADJUVANT
COMPOUND CONSISTING OF A RHO GTPASE FAMILY ACTIVATOR

<130> 0510-1145

<140> 10/589,505

<141> 2006-08-15

<150> PCT/EP05/002105

<151> 2005-02-25

<150> EP 04300100.7

<151> 2004-02-26

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<170> PatentIn Ver. 3.3

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Tyr	Thr	Gly	Trp	Asp	His	Leu	Gly	Lys	Tyr	Lys	Thr	Glu	Val	Leu	Thr	
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Leu	Thr	Gln	Ala	Ala	Leu	Ile	Asn	Ile	Gly	Tyr	Arg	Phe	Asp	Val	Phe	
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 Ala Lys Lys Pro Phe Leu Phe Lys Lys Asn Ile Ala Asp Leu Arg Leu
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 Thr Leu Lys Glu Leu Ile Lys Asp Ser Asp Lys Gln Gln Leu Leu Ser
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 Gln His Phe Ser Leu Tyr Ser Arg Gln Asp Gly Val Ser Tyr Ala Gly
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          20          25          30
Arg Cys Phe Lys Thr Asp Leu Pro Trp Phe Ser Gln Val Asp Pro Asp
          35          40          45
Asn Thr Tyr Phe Ile Arg Phe Ser Gln Ser Arg Ser Asn Ser Arg Ser
          50          55          60
Tyr Thr Gly Trp Asp His Leu Gly Lys Tyr Lys Thr Gly Val Leu Thr
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Leu Thr Gln Ala Ala Leu Ile Asn Ile Gly Tyr His Phe Asp Val Phe
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Asp Asp Ala Asn Ala Ser Ala Gly Ile Tyr Lys Thr Ser Ser Ala Asp
          100          105          110
Met Phe Asn Glu Lys Asn Glu Glu Lys Met Leu Pro Ser Glu Tyr Leu
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Ser Asp Tyr Trp Ser Lys Tyr Tyr Asp Lys Phe Lys Leu Leu Leu Lys
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Asp Glu Tyr Glu Tyr Asn Phe Ser Ile Ser Ala Leu Asn Arg Arg Asp
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Asn Ile Ser Leu Phe Phe Phe Asp Ile Tyr Gly Tyr Tyr Ser Ser Asp
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Met Phe Val Ala Lys Asn Asn Glu Arg Val Met Leu Phe Ile Pro Gly
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Ala Lys Lys Pro Phe Leu Phe Glu Lys Asn Ile Ala Asp Leu Arg Ile
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Ser Leu Lys Asn Leu Ile Lys Glu Asn Asp Asn Lys Gln Leu Leu Ser
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Gln His Phe Ser Leu Tyr Ser Arg Gln Asp Gly Ile Thr Tyr Ala Gly
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Ile	Val	Ile	Lys	Ser	Asn	Ser	Glu	Ala	Gln	Arg	Asp	Tyr	Ala	Leu	Thr
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 Leu Val Thr Leu Met Arg Gly Thr Thr Glu Glu Glu Ala Trp Asn Ile
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 Leu Leu Gly Gln Gly Pro Gln Ser Ser Leu Gly Phe Thr Glu Tyr Thr
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 Thr Tyr Trp Lys Lys Tyr Asn Leu Thr Asn Glu Thr Ser Ile Ile Arg
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 Glu Val Gln Glu Gly Lys Pro Val Ile Ile Thr Ser Gly Asn Leu Ser
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Val Phe Ser Lys Asp Phe
1010

<213> *Yersinia pseudotuberculosis*

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Asn Leu Tyr Phe Ile Arg Phe Thr Gln Ser Arg Ser Asn Asn Lys Ser
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Asp Glu Ala Asn Ser Thr Ala Gly Ile Tyr Lys Thr Asn Asn Ala Asp
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Ser Phe Asp Glu Thr Asn Glu Ala Lys Met Leu Pro Ser Glu Tyr Leu
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Tyr Phe Leu Arg Asp Cys Asp Phe Ser Asn Leu Tyr Asn Lys Ala Leu
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 Ser Asp Tyr Trp Ala Glu Asn Tyr Glu Lys Phe Ser Thr Leu Leu Gln
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 Asn Tyr Tyr Ile Ser Ser Ala Tyr Tyr Leu Tyr Lys Asp Ser Ala Ile
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 Ser Lys Asp Glu Tyr Glu Phe Ser Ile Asp Ala Ile Phe Asn Lys Lys
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 Ser Lys Ile Leu Arg Tyr Tyr Phe Asp Val Tyr Gly Tyr Tyr Ser Ser
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 Asp Met Phe Val Ala Met Asn Asp Asn Lys Thr Met Leu Phe Ile Pro
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 Gly Ala Thr Asn Pro Phe Ile Phe Ala Asp Asn Ile Thr Asp Leu Arg
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 Asp Lys Ile Lys Ala Leu Ile Ser Asp Lys Asn Thr Arg Glu Leu Phe
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 Ser Lys His Phe Ser Leu Tyr Asp Arg Gln Asp Gly Asn Thr Tyr Leu
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 Gly Val Asn Ser Met Leu Glu Gln Ile Val Ser Gly Val Val Asp Thr
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 Gly Ser Met Ala Phe Ser Thr Arg Glu Arg Ser Phe Asn Asp Gly Asp
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 Gly Ile Ser Phe Asp Glu Leu Ile Asn Gly Asp Thr Tyr Glu Glu Arg
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 Arg Ser Ala Ile Pro Gly Leu Ala Thr Asn Thr Val Leu Leu Gly Ile
 385 390 395 400
 Ser Phe Ala Ile Pro Phe Leu Ile Ser Lys Ala Glu Glu Asn Lys Leu
 405 410 415
 Ile Ile Asn Asn Leu Val Gly Ser Asp Glu Asn Ile Leu Asn Lys Asn
 420 425 430

Asn	Leu	Gly	Asp	Phe	Leu	Glu	Lys	Tyr	Asn	Ile	Ser	Glu	Ser	Asp	Ile	435	440	445
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Val	Arg	Leu	Val	Lys	Leu	Asn	Asp	Glu	Glu	Gly	Glu	Ile	Val	Ala	Ile	465	470	475
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Val	Ile	Ile	Lys	Val	Gln	Val	Lys	Tyr	Ile	Ser	Asn	Asp	Asn	Val	Leu	660	665	670
Tyr	Ala	Asn	His	Trp	Ala	Ile	Pro	Asp	Glu	Ala	Pro	Val	Glu	Val	Leu	675	680	685
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Lys	Leu	Ser	Phe	Ile	Gln	Lys	Ile	Ala	Asn	Arg	Phe	Leu	Thr	Glu	Asn	705	710	715
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Ile Asn Val Leu Lys Gly Arg Gly Val Phe Ser Ser Arg Arg Leu Arg
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 Gly Asp Val Tyr Val Lys Lys Thr Lys Phe Asp Ser Met Gly Tyr Asp
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 His Thr Gly Asn Ser Glu Ser Leu Ile Gly Phe Thr Ser Thr Ser Gly
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 Lys Pro Asn Ser Met Ile Asn Ile Ser Arg Glu Asn Val Ser Thr Phe
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 Ser Tyr Tyr Thr Asp Asp Ile Gln Leu Pro Ser Phe Gly Thr Ser Val
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Gln	Arg	Pro	Val	Asp	Arg	Ser	Gly	Arg	Leu	Gly	Ser	Val	Phe	Glu	His	145	150	155	160
Pro	Leu	Trp	Phe	Ala	Tyr	Asp	Glu	Leu	Ala	Gly	Thr	Val	Asp	Leu	Asp	165	170	175	
Ala	Asp	Ile	Tyr	Glu	Gln	Ala	Leu	Ala	Glu	Ser	Ile	Glu	Arg	Arg	Met	180	185	190	
Asp	Gly	Glu	Pro	Asp	Asp	Gly	Ser	Leu	Asp	Thr	Ala	Glu	His	Asp	Val	195	200	205	
Trp	Arg	Leu	Cys	Arg	Asp	Gly	Ile	Asn	Arg	Gly	Glu	Gln	Ala	Ile	Phe	210	215	220	
Gln	Ala	Ser	Gly	Pro	Tyr	Gly	Val	Val	Ala	Asp	Ala	Gly	Tyr	Met	Arg	225	230	235	240
Thr	Val	Ala	Asp	Leu	Ala	Tyr	Ala	Asp	Ala	Leu	Ala	Asp	Cys	Leu	His	245	250	255	
Ala	Gln	Leu	Arg	Ile	Arg	Ala	Gln	Gly	Ser	Val	Asp	Ser	Pro	Gly	Asp	260	265	270	

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 Ala Ala Thr Gln Gln Ala Arg Val Asp Leu Leu Glu Ala Ala Phe Ala
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 Leu Asp Tyr Ala Ala Leu Arg Asp Val Arg Val Tyr Gly Asp Tyr Arg
 305 310 315 320
 Asn Ala Leu Ala Leu Arg Phe Ile Lys Arg Glu Ala Leu Arg Leu Leu
 325 330 335
 Gly Ala Arg Arg Gly Asn Ala Ser Thr Met Pro Ala Val Ala Ala Gly
 340 345 350
 Glu Tyr Asp Glu Ile Val Ala Ser Gly Ala Ala Asn Asp Ala Ala Tyr
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 Val Ser Met Ala Ala Ala Leu Ile Ala Gly Val Leu Cys Asp Leu Glu
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 Ser Ala Gln Arg Thr Leu Pro Val Val Leu Ala Arg Phe Arg Pro Leu
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 Gly Val Leu Ala Arg Phe Arg Arg Leu Glu Gln Glu Thr Ala Gly Met
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 Leu Leu Gly Asp Gln Glu Pro Glu Pro Arg Gly Phe Ile Ser Phe Thr
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 Asp Phe Arg Asp Ser Asp Ala Phe Ala Ser Tyr Ala Glu Tyr Ala Ala
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 Gln Phe Asn Asp Tyr Ile Asp Gln Tyr Ser Ile Leu Glu Ala Gln Arg
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 465 470 475 480
 Cys Leu Pro Leu Gln Lys Val Arg His Tyr Lys Val Leu Thr Ser Gln
 485 490 495
 Pro Gly Leu Ile Ala Arg Gly Ile Glu Asn His Asn Arg Gly Ile Glu
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 Tyr Cys Leu Gly Arg Pro Pro Leu Thr Asp Leu Pro Gly Leu Phe Thr
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 Gly Glu Leu Trp Ser Asp Val Leu Ala Asn Ala Glu Val Met Gln Asn
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 Pro Thr Leu Ala Ala Leu Ala Glu Pro Gln Gly Arg Phe Arg Thr Gly
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 Leu Arg His Ser Leu Asp Asp Leu Ala Ala His Ala Lys Ser Ala Leu
 645 650 655
 Tyr Lys Pro Ser Glu Trp Gln Lys Phe Ala Phe Trp Ile Val Pro Phe
 660 665 670
 Tyr Arg Glu Ile Phe Phe Ser Thr Gln Asp Arg Ser Tyr Arg Val Asp
 675 680 685
 Val Gly Ser Ile Val Phe Asp Ser Ile Ser Leu Leu Ala Ser Val Phe
 690 695 700
 Ser Ile Gly Gly Lys Leu Gly Ser Phe Thr Arg Thr Gln Tyr Gly Asn
 705 710 715 720
 Leu Arg Asn Phe Val Val Arg Gln Arg Ile Ala Gly Leu Ser Gly Gln
 725 730 735
 Arg Leu Trp Arg Ser Val Leu Lys Glu Leu Pro Ala Leu Ile Gly Ala
 740 745 750
 Ser Gly Leu Arg Leu Ser Arg Ser Leu Leu Val Asp Leu Tyr Glu Ile
 755 760 765
 Phe Glu Pro Val Pro Ile Arg Arg Leu Val Ala Gly Phe Val Ser Ala
 770 775 780
 Thr Thr Val Gly Gly Arg Asn Gln Ala Phe Leu Arg Gln Ala Phe Ser
 785 790 795 800
 Ala Ala Ser Ser Ser Ala Gly Arg Thr Gly Gly Gln Leu Ala Ser Glu
 805 810 815
 Trp Arg Met Ala Gly Val Asp Ala Thr Gly Leu Val Glu Ser Thr Ser
 820 825 830
 Gly Gly Arg Phe Glu Gly Ile Tyr Thr Arg Gly Leu Gly Pro Leu Ser
 835 840 845
 Glu Cys Thr Glu His Phe Ile Val Glu Ser Gly Asn Ala Tyr Arg Val
 850 855 860
 Ile Trp Asp Ala Tyr Thr His Gly Trp Arg Val Val Asn Gly Arg Leu
 865 870 875 880

Pro Pro Arg Leu Thr Tyr Thr Val Pro Val Arg Leu Asn Gly Gln Gly
 885 890 895
 His Trp Glu Thr His Leu Asp Val Pro Gly Arg Gly Gly Ala Pro Glu
 900 905 910
 Ile Phe Gly Arg Ile Arg Thr Arg Asn Leu Val Ala Leu Ala Ala Glu
 915 920 925
 Gln Ala Ala Pro Met Arg Arg Leu Leu Asn Gln Ala Arg Arg Val Ala
 930 935 940
 Leu Arg His Ile Asp Thr Cys Arg Ser Arg Leu Ala Leu Pro Arg Ala
 945 950 955 960
 Glu Ser Asp Met Asp Ala Ala Ile Arg Ile Phe Phe Gly Glu Pro Asp
 965 970 975
 Ala Gly Leu Arg Gln Arg Ile Gly Arg Arg Leu Gln Glu Val Arg Ala
 980 985 990
 Tyr Ile Gly Asp Leu Ser Pro Val Asn Asp Val Leu Tyr Arg Ala Gly
 995 1000 1005
 Tyr Asp Leu Asp Asp Val Ala Thr Leu Phe Asn Ala Val Asp Arg Asn
 1010 1015 1020
 Thr Ser Leu Gly Arg Gln Ala Arg Met Glu Leu Tyr Leu Asp Ala Ile
 1025 1030 1035 1040
 Val Asp Leu His Ala Arg Leu Gly Tyr Glu Asn Ala Arg Phe Val Asp
 1045 1050 1055
 Leu Met Ala Phe His Leu Leu Ser Leu Gly His Ala Ala Thr Ala Ser
 1060 1065 1070
 Glu Val Val Glu Ala Val Ser Pro Arg Leu Leu Gly Asn Val Phe Asp
 1075 1080 1085
 Ile Ser Asn Val Ala Gln Leu Glu Arg Gly Ile Gly Asn Pro Ala Ser
 1090 1095 1100
 Thr Gly Leu Phe Val Met Leu Gly Ala Tyr Ser Glu Ser Ser Pro Ala
 1105 1110 1115 1120
 Ile Phe Gln Ser Phe Val Asn Asp Ile Phe Pro Ala Trp Arg Gln Ala
 1125 1130 1135
 Ser Gly Gly Gly Pro Leu Val Trp Asn Phe Gly Pro Ala Ala Ile Ser
 1140 1145 1150
 Pro Thr Arg Leu Asp Tyr Ala Asn Thr Asp Ile Gly Leu Leu Asn His
 1155 1160 1165
 Gly Asp Ile Ser Pro Leu Arg Ala Arg Pro Pro Leu Gly Gly Arg Arg
 1170 1175 1180

Asp Ile Asp Leu Pro Pro Gly Leu Asp Ile Ser Phe Val Arg Tyr Asp
 1185 1190 1195 1200
 Arg Pro Val Arg Met Ser Ala Pro Arg Ala Leu Asp Ala Ser Val Phe
 1205 1210 1215
 Arg Pro Val Asp Gly Pro Val His Gly Tyr Ile Gln Ser Trp Thr Gly
 1220 1225 1230
 Ala Glu Ile Glu Tyr Ala Tyr Gly Ala Pro Ala Ala Ala Arg Glu Val
 1235 1240 1245
 Met Leu Thr Asp Asn Val Arg Ile Ile Ser Ile Glu Asn Gly Asp Glu
 1250 1255 1260
 Gly Ala Ile Gly Val Arg Val Arg Leu Asp Thr Val Pro Val Ala Thr
 1265 1270 1275 1280
 Pro Leu Ile Leu Thr Gly Gly Ser Leu Ser Gly Cys Thr Thr Met Val
 1285 1290 1295
 Gly Val Lys Glu Gly Tyr Leu Ala Phe Tyr His Thr Gly Lys Ser Thr
 1300 1305 1310
 Glu Leu Gly Asp Trp Ala Thr Ala Arg Glu Gly Val Gln Ala Leu Tyr
 1315 1320 1325
 Gln Ala His Leu Ala Met Gly Tyr Ala Pro Ile Ser Ile Pro Ala Pro
 1330 1335 1340
 Met Arg Asn Asp Asp Leu Val Ser Ile Ala Ala Thr Tyr Asp Arg Ala
 1345 1350 1355 1360
 Val Ile Ala Tyr Leu Gly Lys Asp Val Pro Gly Gly Gly Ser Thr Arg
 1365 1370 1375
 Ile Thr Arg His Asp Glu Gly Ala Gly Ser Val Val Ser Phe Asp Tyr
 1380 1385 1390
 Asn Ala Ala Val Gln Ala Ser Ala Val Pro Arg Leu Gly Gln Val Tyr
 1395 1400 1405
 Val Leu Ile Ser Asn Asp Gly Gln Gly Ala Arg Ala Val Leu Leu Ala
 1410 1415 1420
 Glu Asp Leu Ala Trp Ala Gly Ser Gly Ser Ala Leu Asp Val Leu Asn
 1425 1430 1435 1440
 Glu Arg Leu Val Thr Leu Phe Pro Ala Pro Val
 1445 1450

<210> 5

<211> 240

<212> PRT

<213> Salmonella typhimurium

<400> 5

Met Thr Lys Ile Thr Leu Ser Pro Gln Asn Phe Arg Ile Gln Lys Gln
 1 5 10 15

Glu Thr Thr Leu Leu Lys Glu Lys Ser Thr Glu Lys Asn Ser Leu Ala
 20 25 30

Lys Ser Ile Leu Ala Val Lys Asn His Phe Ile Glu Leu Arg Ser Lys
 35 40 45

Leu Ser Glu Arg Phe Ile Ser His Lys Asn Thr Glu Ser Ser Ala Thr
 50 55 60

His Phe His Arg Gly Ser Ala Ser Glu Gly Arg Ala Val Leu Thr Asn
 65 70 75 80

Lys Val Val Lys Asp Phe Met Leu Gln Thr Leu Asn Asp Ile Asp Ile
 85 90 95

Arg Gly Ser Ala Ser Lys Asp Pro Ala Tyr Ala Ser Gln Thr Arg Glu
 100 105 110

Ala Ile Leu Ser Ala Val Tyr Ser Lys Asn Lys Asp Gln Cys Cys Asn
 115 120 125

Leu Leu Ile Ser Lys Gly Ile Asn Ile Ala Pro Phe Leu Gln Glu Ile
 130 135 140

Gly Glu Ala Ala Lys Asn Ala Gly Leu Pro Gly Thr Thr Lys Asn Asp
 145 150 155 160

Val Phe Thr Pro Ser Gly Ala Gly Ala Asn Pro Phe Ile Thr Pro Leu
 165 170 175

Ile Ser Ser Ala Asn Ser Lys Tyr Pro Arg Met Phe Ile Asn Gln His
 180 185 190

Gln Gln Ala Ser Phe Lys Ile Tyr Ala Glu Lys Ile Ile Met Thr Glu
 195 200 205

Val Ala Pro Leu Phe Asn Glu Cys Ala Met Pro Thr Pro Gln Gln Phe
 210 215 220

Gln Leu Ile Leu Glu Asn Ile Ala Asn Lys Tyr Ile Gln Tyr Thr Pro
 225 230 235 240

<210> 6

<211> 240

<212> PRT

<213> Salmonella typhimurium

<400> 6

Met Thr Asn Ile Thr Leu Ser Thr Gln His Tyr Arg Ile His Arg Ser
 1 5 10 15

Asp Val Glu Pro Val Lys Glu Lys Thr Thr Glu Lys Asp Ile Phe Ala
 20 25 30

Lys	Ser	Ile	Thr	Ala	Val	Arg	Asn	Ser	Phe	Ile	Ser	Leu	Ser	Thr	Ser
		35					40					45			
Leu	Ser	Asp	Arg	Phe	Ser	Leu	His	Gln	Gln	Thr	Asp	Ile	Pro	Thr	Thr
	50					55					60				
His	Phe	His	Arg	Gly	Asn	Ala	Ser	Glu	Gly	Arg	Ala	Val	Leu	Thr	Ser
65					70					75					80
Lys	Thr	Val	Lys	Asp	Phe	Met	Leu	Gln	Lys	Leu	Asn	Ser	Leu	Asp	Ile
				85					90					95	
Lys	Gly	Asn	Ala	Ser	Lys	Asp	Pro	Ala	Tyr	Ala	Arg	Gln	Thr	Cys	Glu
			100					105					110		
Ala	Ile	Leu	Ser	Ala	Val	Tyr	Ser	Asn	Asn	Lys	Asp	Gln	Cys	Cys	Lys
		115					120					125			
Leu	Leu	Ile	Ser	Lys	Gly	Val	Ser	Ile	Thr	Pro	Phe	Leu	Lys	Glu	Ile
	130					135					140				
Gly	Glu	Ala	Ala	Gln	Asn	Ala	Gly	Leu	Pro	Gly	Glu	Ile	Lys	Asn	Gly
145					150					155					160
Val	Phe	Thr	Pro	Gly	Gly	Ala	Gly	Ala	Asn	Pro	Phe	Val	Val	Pro	Leu
				165				170						175	
Ile	Ala	Ser	Ala	Ser	Ile	Lys	Tyr	Pro	His	Met	Phe	Ile	Asn	His	Asn
			180					185					190		
Gln	Gln	Val	Ser	Phe	Lys	Ala	Tyr	Ala	Glu	Lys	Ile	Val	Met	Lys	Glu
		195					200					205			
Val	Thr	Pro	Leu	Phe	Asn	Lys	Gly	Thr	Met	Pro	Thr	Pro	Gln	Gln	Phe
	210					215					220				
Gln	Leu	Thr	Ile	Glu	Asn	Ile	Ala	Asn	Lys	Tyr	Leu	Gln	Asn	Ala	Ser
225					230					235					240

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<210> 7
<211> 166
<212> PRT
<213> Shigella flexneri
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<400> 7
Met Glu Ile Gln Asn Thr Lys Ser Ala Pro Ile Leu Tyr Thr Asp Ile
   1                               5                   10          15

Ser Thr Lys Gln Thr Gln Ser Ser Ser Glu Thr Gln Lys Ser Gln Asn
      20                                25              30

Tyr Gln Gln Leu Ala Ala His Ile Pro Leu Asn Val Gly Lys Asn Pro
    35                                  40              45

Val Leu Thr Thr Thr Leu Asn Asp Asp Gln Leu Leu Lys Leu Ser Glu
   50                55                  60
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Gln Val Gln His Asp Ser Glu Ile Ile Ala Arg Leu Thr Asp Lys Lys
 65 70 75 80
 Met Lys Asp Leu Ser Glu Met Ser His Thr Ile Thr Pro Glu Asn Thr
 85 90 95
 Leu Asp Ile Ser Ser Leu Ser Ser Asn Ala Val Ser Leu Ile Ile Ser
 100 105 110
 Val Ala Val Leu Leu Ser Ala Leu Arg Thr Ala Glu Thr Arg Leu Gly
 115 120 125
 Ser Gln Leu Ser Leu Ile Ala Phe Asp Ala Thr Lys Ser Ala Ala Glu
 130 135 140
 Asn Ile Val Arg Gln Gly Leu Ala Ala Leu Ser Ser Ser Ile Thr Gly
 145 150 155 160
 Ala Val Thr Gln Val Gly
 165

<210> 8
 <211> 1186
 <212> PRT
 <213> Helicobacter pylori

<400> 8
 Met Thr Asn Glu Thr Ile Asp Gln Thr Arg Thr Pro Asp Gln Thr Gln
 1 5 10 15
 Ser Gln Thr Ala Phe Asp Pro Gln Gln Phe Ile Asn Asn Leu Gln Val
 20 25 30
 Ala Phe Ile Lys Val Asp Asn Val Val Ala Ser Phe Asp Pro Asp Gln
 35 40 45
 Lys Pro Ile Val Asp Lys Asn Asp Arg Asp Asn Arg Gln Ala Phe Asp
 50 55 60
 Gly Ile Ser Gln Leu Arg Glu Glu Tyr Ser Asn Lys Ala Ile Lys Asn
 65 70 75 80
 Pro Thr Lys Lys Asn Gln Tyr Phe Ser Asp Phe Ile Asp Lys Ser Asn
 85 90 95
 Asp Leu Ile Asn Lys Asp Asn Leu Ile Asp Val Glu Ser Ser Thr Lys
 100 105 110
 Ser Phe Gln Lys Phe Gly Asp Gln Arg Tyr Gln Ile Phe Thr Ser Trp
 115 120 125
 Val Ser His Gln Lys Asp Pro Ser Lys Ile Asn Thr Arg Ser Ile Arg
 130 135 140
 Asn Phe Met Glu Asn Ile Ile Gln Pro Pro Ile Pro Asp Asp Lys Glu
 145 150 155 160

Lys Ala Glu Phe Leu Lys Ser Ala Lys Gln Ser Phe Ala Gly Ile Ile
 165 170 175
 Ile Gly Asn Gln Ile Arg Thr Asp Gln Lys Phe Met Gly Val Phe Asp
 180 185 190
 Glu Ser Leu Lys Glu Arg Gln Glu Ala Glu Lys Asn Gly Gly Pro Thr
 195 200 205
 Gly Gly Asp Trp Leu Asp Ile Phe Leu Ser Phe Ile Phe Asn Lys Lys
 210 215 220
 Gln Ser Ser Asp Val Lys Glu Ala Ile Asn Gln Glu Pro Val Pro His
 225 230 235 240
 Val Gln Pro Asp Ile Ala Thr Thr Thr Thr Asp Ile Gln Gly Leu Pro
 245 250 255
 Pro Glu Ala Arg Asp Leu Leu Asp Glu Arg Gly Asn Phe Ser Lys Phe
 260 265 270
 Thr Leu Gly Asp Met Glu Met Leu Asp Val Glu Gly Val Ala Asp Ile
 275 280 285
 Asp Pro Asn Tyr Lys Phe Asn Gln Leu Leu Ile His Asn Asn Ala Leu
 290 295 300
 Ser Ser Val Leu Met Gly Ser His Asn Gly Ile Glu Pro Glu Lys Val
 305 310 315 320
 Ser Leu Leu Tyr Ala Gly Asn Gly Gly Phe Gly Asp Lys His Asp Trp
 325 330 335
 Asn Ala Thr Val Gly Tyr Lys Asp Gln Gln Gly Asn Asn Val Ala Thr
 340 345 350
 Leu Ile Asn Val His Met Lys Asn Gly Ser Gly Leu Val Ile Ala Gly
 355 360 365
 Gly Glu Lys Gly Ile Asn Asn Pro Ser Phe Tyr Leu Tyr Lys Glu Asp
 370 375 380
 Gln Leu Thr Gly Ser Gln Arg Ala Leu Ser Gln Glu Glu Ile Arg Asn
 385 390 395 400
 Lys Val Asp Phe Met Glu Phe Leu Ala Gln Asn Asn Thr Lys Leu Asp
 405 410 415
 Asn Leu Ser Glu Lys Glu Lys Glu Lys Phe Gln Asn Glu Ile Glu Asp
 420 425 430
 Phe Gln Lys Asp Ser Lys Ala Tyr Leu Asp Ala Leu Gly Asn Asp Arg
 435 440 445
 Ile Ala Phe Val Ser Lys Lys Asp Thr Lys His Ser Ala Leu Ile Thr
 450 455 460

Glu Phe Asn Asn Gly Asp Leu Ser Tyr Thr Leu Lys Asp Tyr Gly Lys
 465 470 475 480
 Lys Ala Asp Lys Ala Leu Asp Arg Glu Lys Asn Val Thr Leu Gln Gly
 485 490 495
 Ser Leu Lys His Asp Gly Val Met Phe Val Asp Tyr Ser Asn Phe Lys
 500 505 510
 Tyr Thr Asn Ala Ser Lys Asn Pro Asn Lys Gly Val Gly Ala Thr Asn
 515 520 525
 Gly Val Ser His Leu Glu Ala Gly Phe Asn Lys Val Ala Val Phe Asn
 530 535 540
 Leu Pro Asp Leu Asn Asn Leu Ala Ile Thr Ser Phe Val Arg Arg Asn
 545 550 555 560
 Leu Glu Asn Lys Leu Thr Ala Lys Gly Leu Ser Leu Gln Glu Ala Asn
 565 570 575
 Lys Leu Ile Lys Asp Phe Leu Ser Ser Asn Lys Glu Leu Ala Gly Lys
 580 585 590
 Ala Leu Asn Phe Asn Lys Ala Val Ala Glu Ala Lys Ser Thr Gly Asn
 595 600 605
 Tyr Asp Glu Val Lys Lys Ala Gln Lys Asp Leu Glu Lys Ser Leu Arg
 610 615 620
 Lys Arg Glu His Leu Glu Lys Glu Val Glu Lys Lys Leu Glu Ser Lys
 625 630 635 640
 Ser Gly Asn Lys Asn Lys Met Glu Ala Lys Ala Gln Ala Asn Ser Gln
 645 650 655
 Lys Asp Glu Ile Phe Ala Leu Ile Asn Lys Glu Ala Asn Arg Asp Ala
 660 665 670
 Arg Ala Ile Ala Tyr Thr Gln Asn Leu Lys Gly Ile Lys Arg Glu Leu
 675 680 685
 Ser Asp Lys Leu Glu Lys Ile Ser Lys Asp Leu Lys Asp Phe Ser Lys
 690 695 700
 Ser Phe Asp Glu Phe Lys Asn Gly Lys Asn Lys Asp Phe Ser Lys Ala
 705 710 715 720
 Glu Glu Thr Leu Lys Ala Leu Lys Gly Ser Val Lys Asp Leu Gly Ile
 725 730 735
 Asn Pro Glu Trp Ile Ser Lys Val Glu Asn Leu Asn Ala Ala Leu Asn
 740 745 750
 Glu Phe Lys Asn Gly Lys Asn Lys Asp Phe Ser Lys Val Thr Gln Ala
 755 760 765

Lys Ser Asp Leu Glu Asn Ser Val Lys Asp Val Ile Ile Asn Gln Lys
 770 775 780
 Val Thr Asp Lys Val Asp Asn Leu Asn Gln Ala Val Ser Val Ala Lys
 785 790 795 800
 Ala Met Gly Asp Phe Ser Arg Val Glu Gln Val Leu Ala Asp Leu Lys
 805 810 815
 Asn Phe Ser Lys Glu Gln Leu Ala Gln Gln Ala Gln Lys Asn Glu Asp
 820 825 830
 Phe Asn Thr Gly Lys Asn Ser Glu Leu Tyr Gln Ser Val Lys Asn Ser
 835 840 845
 Val Asn Lys Thr Leu Val Gly Asn Gly Leu Ser Gly Ile Glu Ala Thr
 850 855 860
 Ala Leu Ala Lys Asn Phe Ser Asp Ile Lys Lys Glu Leu Asn Glu Lys
 865 870 875 880
 Phe Lys Asn Phe Asn Asn Asn Asn Gly Leu Lys Asn Ser Thr Glu
 885 890 895
 Pro Ile Tyr Ala Lys Val Asn Lys Lys Lys Thr Gly Gln Val Ala Ser
 900 905 910
 Pro Glu Glu Pro Ile Tyr Thr Gln Val Ala Lys Lys Val Asn Ala Lys
 915 920 925
 Ile Asp Arg Leu Asn Gln Ile Ala Ser Gly Leu Gly Gly Val Gly Gln
 930 935 940
 Ala Ala Gly Phe Pro Leu Lys Arg His Asp Lys Val Asp Asp Leu Ser
 945 950 955 960
 Lys Val Gly Leu Ser Ala Ser Pro Glu Pro Ile Tyr Ala Thr Ile Asp
 965 970 975
 Asp Leu Gly Gly Pro Phe Pro Leu Lys Arg His Asp Lys Val Asp Asp
 980 985 990
 Leu Ser Lys Val Gly Arg Ser Arg Asn Gln Glu Leu Ala Gln Lys Ile
 995 1000 1005
 Asp Asn Leu Asn Gln Ala Val Ser Glu Ala Lys Ala Gly Phe Phe Gly
 1010 1015 1020
 Asn Leu Glu Gln Thr Ile Asp Lys Leu Lys Asp Ser Thr Lys Lys Asn
 1025 1030 1035 1040
 Val Met Asn Leu Tyr Val Glu Ser Ala Lys Lys Val Pro Ala Ser Leu
 1045 1050 1055
 Ser Ala Lys Leu Asp Asn Tyr Ala Ile Asn Ser His Thr Arg Ile Asn
 1060 1065 1070

Ser Asn Ile Gln Asn Gly Ala Ile Asn Glu Lys Ala Thr Gly Met Leu
 1075 1080 1085

Thr Gln Lys Asn Pro Glu Trp Leu Lys Leu Val Asn Asp Lys Ile Val
 1090 1095 1100

Ala His Asn Val Gly Ser Val Ser Leu Ser Glu Tyr Asp Lys Ile Gly
 1105 1110 1115 1120

Phe Asn Gln Lys Asn Met Lys Asp Tyr Ser Asp Ser Phe Lys Phe Ser
 1125 1130 1135

Thr Lys Leu Asn Asn Ala Val Lys Asp Ile Lys Ser Gly Phe Thr His
 1140 1145 1150

Phe Leu Ala Asn Ala Phe Ser Thr Gly Tyr Tyr Cys Leu Ala Arg Glu
 1155 1160 1165

Asn Ala Glu His Gly Ile Lys Asn Val Asn Thr Lys Gly Gly Phe Gln
 1170 1175 1180

Lys Ser
 1185

<210> 9
 <211> 201
 <212> PRT
 <213> Homo sapiens

<400> 9
 Ser Ser Gly Pro Ser Ser Ser Leu Asp Asn Gly Asn Ser Leu Asp Val
 1 5 10 15

Leu Lys Asn His Val Leu Asn Glu Leu Ile Gln Thr Glu Arg Val Tyr
 20 25 30

Val Arg Glu Leu Tyr Thr Val Leu Leu Gly Tyr Arg Ala Glu Met Asp
 35 40 45

Asn Pro Glu Met Phe Asp Leu Met Pro Pro Leu Leu Arg Asn Lys Lys
 50 55 60

Asp Ile Leu Phe Gly Asn Met Ala Glu Ile Tyr Glu Phe His Asn Asp
 65 70 75 80

Ile Phe Leu Ser Ser Leu Glu Asn Cys Ala His Ala Pro Glu Arg Val
 85 90 95

Gly Pro Cys Phe Leu Glu Arg Lys Asp Asp Phe Gln Met Tyr Ala Lys
 100 105 110

Tyr Cys Gln Asn Lys Pro Arg Ser Glu Thr Ile Trp Arg Lys Tyr Ser
 115 120 125

Glu Cys Ala Phe Phe Gln Glu Cys Gln Arg Lys Leu Lys His Arg Leu
 130 135 140

Arg Leu Asp Ser Tyr Leu Leu Lys Pro Val Gln Arg Ile Thr Lys Tyr
145 150 155 160

Gln Leu Leu Leu Lys Glu Leu Leu Lys Tyr Ser Lys Asp Cys Glu Gly
165 170 175

Ser Ala Leu Leu Lys Lys Ala Leu Asp Ala Met Leu Asp Leu Leu Lys
180 185 190

Ser Val Asn Asp Ser Met His Gln Ile
195 200